

Date: November 3, 1980

Subject: ARCO Test - Second Phase

From/Location: R.G. Saurey

To/Location: T.F. Payne

Background

The first phase of testing of dedusted ARCO coke is scheduled for completion during October 1980 with final evaluation of pin corrosion results due in mid-November 1980. At a meeting in Harvey, Illinois with T.F. Payne, B.C. Vitchus, D.F. Ryan, and R.A. Moore in attendance, it was agreed that results from the first test would justify further testing with non-dedusted ARCO coke as the test aggregate. Proposals for the second phase of testing along with a time table for completion is the subject of this memo.

Proposal

1. Scope - The objective of the second ARCO test is to determine relative anode performance based on operating experience gained from 10 test pots with 100% untreated ARCO aggregate vs. 10 control pots with plant run aggregate. The duration of the proposed test would be a minimum of one complete anode burn-off cycle after the initial transition cycle is complete (approximately six months). Pot operations and internal anode structure would be the primary areas of interest in this case. A possible future option would be a breakdown of the ARCO test into two subgroups consisting of five pots with untreated aggregate and five pots with aromatic type dedust oil.
2. Test Pots - The proposed test groups are Pots 651-660 for the 100% ARCO untreated aggregate and Pots 641-650 for the plant run aggregate. Average pot age, in this case, would be 625 days and 735 days respectively, with both groups having approximately equal numbers of SK and conventional cathodes. See attached description for individual pot construction details.
3. Storage - A supply of untreated ARCO coke will be maintained separately in the west chemical silo. A minimum inventory of 300 tons is recommended. High and low vitamin and normal briquets will be stored in the courtyard between Rooms 8 and 9. Pin hole paste will be stored in the west bin at the north end of Room 8.
4. Mixing of Briquets - The test paste should be made in batches after thorough flushing of the system. The recommended pitch targets for the initial batch are as follows with adjustments to be made as determined by flow properties.

High Vitamin-----	31.0% Pitch
Normal-----	30.0% Pitch or Elongation Target - 12%
Low Vitamin-----	29.0% Pitch
Pin Hole Paste-----	47.0% Pitch

No more than one quarter of the total paste requirement should be mixed in the first batch in order to establish operating characteristics of the test coke.

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5. Aggregate Composition - Aggregate blends for mixing test paste should be in accordance with the following standards for plant run anode paste.

Coarse	35% \pm 3%
Medium	8% \pm 3%
Fine	57% \pm 3%
Minus 200 in Fines	62% \pm 3%

CORRECTED SCREEN CURVE

<u>No.</u>	<u>%</u>	<u>WM %</u>
371	5	5
4	18	23
8	6	29
14	6	35
20	2	37
28	2	39
48	1	40
65	3	43
100	5	48
150	7	55
200	8	63
Pan	37	100

6. Monitoring - All pin pulling and briquet charging will be done in accordance with the standard five pin pattern schedule with monitoring to be provided by the shift technician and potline supervision. All other operations will be in accordance with standard procedures for new style Anaconda cells.
7. Evaluation - The evaluation of untreated ARCO coke as applied to Columbia Falls operations will be based on the following factors:
- A. Pot Operations:
 - 1. Metal Production
 - 2. Metal Purity
 - 3. Energy Consumption
 - B. Anode Operation
 - 1. Carbon Burn-off
 - 2. Anode Current Distribution
 - 3. Spiking and Shatter Frequency
 - 4. Severity Index
 - C. Environmental
 - 1. Particulate Contribution to Secondary System
 - D. Anode Structure
 - 1. Mechanical Properties
 - 2. Electrical Properties
 - 3. Reactivity
 - 4. Shrinkage
 - 5. Structural Differences vs. Location in the Anode
 - E. Anode Temperature Profile
 - 1. Anode temperature during the transition from ARCO oiled to ARCO untreated coke will be determined for both test pots and control pots by "baked in" thermocouples per request of Bob Moore of Harvey Technical Center.


(Continued)

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8. Proposed Time Table - A proposed schedule for carrying out the Phase 2 evaluation is shown in the attached project plan.

9. Proposed Team Composition -

Project Leader-----R.G. Saurey
Environmental & Laboratory-----D.F. Ryan
Paste Production-----A.B. Barkley
Cell Operation & Logistics-----L.L. Porter
Data & Evaluation-----L.M. Long
Technical Support -----Harvey Technical Center


R.G. Saurey

RGS/lrb

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